This invention relates generally to dispensing devices, and more particularly to an apparatus for expressing the contents of compressible tubes.

Compressible tubes, generally of metal, for holding tooth-paste, ointment, shaving-cream, and the like, are at present in common use. Such tubes are closed at one end and at the opposite end are fitted with a nozzle having a delivery aperture through which the material is expelled by pressure on the tube. In the proper and economical use of such tubes, it is desirable that the tube should be compressed at its closed end and should be so compressed progressively toward the nozzle end, in order to properly expel the contents, without waste, and without bursting or fracturing the tube.

Commonly, such tubes are compressed by the fingers of the user, with considerable liability of damage and waste of the contents.

A principal object of the invention is to provide an improved appliance by which the contents of such tubes are expressed mechanically, and moreover, by which the amount or quantity of the contents so expressed is accurately adjusted.

According to this invention, the appliance comprises two parallel rollers in combination with operating mechanisms to be actuated by the user, whereby the rollers can be rotated about their axes in opposite directions, and with a step-by-step motion. The tube is drawn between the rollers, and the material within the tube is thereby extruded from the aperture at the opposite end of the tube, the amount so extruded or expressed being regulated in accordance with the number of movements given to the operating mechanism by the person manipulating the device. The operating mechanism may be contained within a bracket that is attachable to a wall or other structure.

The invention further comprises a cap at the nozzle end of the tube, the cap presenting an aperture that opens only when the contents within the tube are under pressure.

The accompanying drawings illustrate a preferred embodiment of the invention, wherein the device is designed to operate on a vertically depending tube. It is obvious, therefore, that the device may be modified to operate on horizontally positioned tubes, and that further modifications may be made therein without departing from the spirit of the invention as hereinafter claimed.

Figure 1 represents a front elevation of the new and improved apparatus, in conjunction with the tube.

Figure 2 is a vertical cross-section of the device shown in Figure 1, at right angles thereto.

Figure 3 is a front elevation of the bracket that holds the operating mechanism.

Figure 4 is a horizontal section of the device, taken along the line 4—4 of Figure 1.

Figure 5 is a vertical section of the device, taken along the line 5—5 of Figure 1.

Figure 6 is a front view of the nozzle cap.

Figure 7 is a rear view of the nozzle cap.

The nozzle cap will first be described.

The cap 10 is adapted to fit on the usual threaded end of a tube, and comprises a shoulder 14 against which the neck of the tube abuts. The shoulder 11 opens into a converging guide-way 12, and a tight orifice 13. The orifice 13 is ribbon-shaped, as indicated most clearly in Figures 6 and 7, and the lips 14 of the cap are in normal contact with each other to create an absolute seal.

The orifice 13 will allow passage of the tube's contents therethrough, when pressure is applied to the tube, and subsequent manual pressure on the lips 14 will serve to again seal the orifice 13. Initially, the cap 10 is provided with a joint 15 which may be cut off along the line 16 to make the cap operative. The cap 10 is further provided with corrugations 17 to facilitate the rotation of the cap when applying it to the nipple of the tube.

The closed end 20 of the tube 21 is adapted to be passed upwardly between two parallel horizontal rollers 22 and 23, which are knurled or serrated to provide a gripping action. The rollers 22 and 23 are mounted in a housing 24 that is open at the bottom and enclosed on its four sides, and that is provided at its bottom with diverging guide members 26 and 27. The top 25 may be either entirely open or provided with a guide slot 26 for the closed end 20 of the tube 21. The roller 22 is borne on a shaft 28, and a roller 23 is borne on a similar shaft 29. The ends of the shaft 28 are provided with pinions 31 and 32 fixed thereon, and the shaft 29 is similarly provided with the pinions 33 and 34.

A pair of horizontal arms 40 and 41 are horizontally movable in slots in one face of the housing 24 adjacent the roller 22. A similar pair of arms 42 and 43 are movable on the opposite side of the housing 24, adjacent the roller 23. The arms 40 and 41 are secured to an actuator bar 44, and the arms 42 and 43 are likewise secured to an actuator bar 46. The bars 44 and 46 are joined...
to the housing 24 by means of a spring 48 and 49 respectively. The springs 48 and 49 normally urge the actuator bars 45 and 46 away from each other and away from the housing 24.

Pivotal on a horizontal pin 51 on the arm 43 is a dog 52, which is urged into ratchet engagement with the teeth of the pinion 34 by a spring 53 likewise affixed to the arm 43. The arm 40 may be similarly provided with a dog 54 to engage the teeth of the pinion 31. It will be obvious, therefore, that as the actuator bars 45 and 46 are manually pressed toward each other against the tension of the springs 48 and 49, the arm 43 will bear against the ear 50 of the dog 52 to turn the pinion 34 in one direction, while simultaneously the dog 54 will engage the pinion 31 for rotation in the opposite direction. As a result, the rollers 22 and 23 will be rotated in opposite directions, as indicated by the arrows in Figure 5, to feed the tube 21 upwardly.

In the operation of the device, the upper end 20 of the tube 21 is positioned between the rollers 22 and 23. The actuating bars 45 and 46 are manually pressed toward each other, and the gears in the housing 24 will rotate the rollers 22 and 23 until a desired amount of the material from within the tube 21 has been extruded through the orifice 13 in the cap 10 at the bottom of the tube. Thereafter, a slight pressure on the lips 14 of the cap 10 will again effectively seal the cap 10. There will be no mess or bother, and the operation will be completely sanitary. If the tube 21 does not come equipped with the cap 10, the ordinary cap may be discarded and the new and improved cap 10 substituted therefor.

What is claimed is:
1. An appliance for extruding the contents of a collapsible tube comprising a housing open at the top and bottom thereof, a pair of substantially parallel rollers rotatable in said housing and disposed in frictional engagement with each other, a first pinion secured to one end of one of said rollers, a second pinion secured to the corresponding end of the other roller and meshing with the first pinion, a pair of opposed actuator bars slidably supported on opposite sides of the housing, arms on said actuator bars slidably through said housing near the peripheral edges of the pinions, a spring pressed dog rockable on one of said arms and engaging one of said pinions, and spring means connected with said actuator bars for urging the same outwardly from the housing whereby movement of the actuator bars toward each other actuates said rollers for compressing a collapsible tube arranged therebetween.
2. An appliance for extruding the contents of a collapsible tube comprising a housing having one end open and provided in its opposite end with a slot, a pair of substantially parallel rollers rotatably mounted within the housing and arranged in substantially contacting relation, pairs of pinions secured to corresponding ends of the rollers, the pinions of the pairs meshing with each other, a pair of opposed actuator bars arranged near opposite sides of the housing and exteriorly of the housing, said opposite sides of the housing being provided with pairs of spaced aligned openings, pairs of spaced arms secured to the actuator bars and extending slidably through the pairs of aligned openings and into the housing and near the peripheries of the pairs of pinions, a spring pressed dog pivotally secured to one arm of each pair of arms and engaging one pinion of each pair of pinions and leaf springs arranged between said opposite sides of the housing and actuator bars and urging the actuator bars outwardly from said opposite sides of the housing whereby movement of the bars toward each other turns the rollers for compressing a collapsible tube arranged therebetween, the compressed tube passing through the slot in said opposite end of the housing.

GEORGE H. SNYDER.

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